

# A note on two species of *Ipomoea*, namely *I. carnea* Jacq. and *I. fistulosa* Mart. ex Choisy in eastern Asia<sup>1</sup>

P. K. BHATTACHARYYA<sup>2</sup>

Two south American perennial, shrubby, ornamentals, *Ipomoea carnea* Jacq. and *I. fistulosa* Mart. ex Choisy were introduced in the gardens of eastern Asia and are now growing wild in the area and have been incorporated in the regional floras. The two species are very similar and have been often confused with each other. To understand their distinguishing characters clearly, detailed morphological, ecological and anatomical studies have been carried out. Floral and fruit-structure of the two species are identical but the habit, leaf structure and anatomy help to distinguish them easily.

*Ipomoea carnea* Jacq. is recorded from India by several authors (Parker 1918; Haines 1921-24; Bor & Raizada. 1954; Maheswari 1963) and described (Boerl 1899; Koorders 1912; Gagnep & Couch 1915; Backer 1931) and in other east Asian countries but Van Ooststroom (1940) doubted about their authenticity and stated that they had used the name *I. carnea* for the Asiatic specimens most probably wrongly. Haines described it from Bihar and Orissa but stated that he was not sure of the current name of the shrub.

Van Ooststroom (1940) described *I. crassicaulis* (Benth.) Rob. (= *I. fistulosa* Mart. ex Choisy) from Malay peninsula. Hara (1966) described it from eastern Himalayas.

According to Tucker (1930), O'Donell (1952) and Van Ooststroom (1953) by the principle of priority, the name *I. crassicaulis* (Benth.) Rob. is a synonym and *I. fistulosa*

Mart. ex Choisy the valid name of the species.

Datta & Majumdar (1966) noted only *I. fistulosa* from Calcutta and its suburbs.

Regarding the capsule and seed structure of *I. fistulosa*, differing reports are available. Glabrous, globose capsule, glabrate seeds were observed by Choisy but according to Van Ooststroom and the author the capsule is ovoid, densely pubescent at the base and seeds are silky villous. Haines' observation of 4-celled ovary of *I. carnea* is an artifact. Bor & Raizada note that 'carneus' means flesh-coloured and refer to the colour of the corolla but Jacquin (1763) observed white flowers.

It is interesting to note that the two species are very close and similar in their floral and fruit-structure. These two south American species were introduced in Indian agri-horticultural gardens as ornamental cultivated plants and their introduction in to other Asiatic countries happened probably in the same way.

I noted that the habit of *I. carnea* varies

<sup>1</sup> Accepted April 1973.

<sup>2</sup> Present address: Dept. of Botany, Faculty of Science, University of Kalyani, Kalyani, Nadia 741 235, (W.B.).

from a true climber to liana condition, and the character of the leaves are very prominent in *I. carnea* along with its almost solid stem. The leaf structure of shrubby *I. fistulosa* is variable but a wide survey reveals that the leaf is sagittate and distinctly acuminate. The young stem of *I. fistulosa* is swollen, milky and hollow.

In connection with taxonomic study of Indian convolvulaceae and from the original descriptions, I am convinced that *I. carnea* along with *I. fistulosa* occur widely in eastern Asia particularly in India and Burma.

Both are lenticellate, pale greyish at maturity, but when young—green, covered with hairs; and have glands at the base of midrib of the leaves. Their common characters are as follows:- Secondary nerves of the leaf parallel, petiole slender; inflorescence axillary, cymose on a long (about 5.15 cm) peduncle; bracts small caducous; calyx persistent, never enlarged; corolla pinkish white; flowers large (7.5-9 cm long), tube constricted close to the base, filaments and style included, stamen unequal, capsule glabrous, ovoid, mucronulate due to persistent style base, brown, four-valved, inner side of the capsule wall pearl white, two celled, each cell with two seeds and with an incomplete partition wall at replum from the top of the capsule; seeds large (about 8 mm long, 5 mm broad) subovoid, black, ascending, attached to the base of replum; testa with loose grey, villous hairs which help their dispersal by wind to some extent.

To understand the distinguishing characters more clearly, the detailed morphological, ecological and anatomical studies of these two species have been undertaken and discussed in the present paper.

*Ipomoea carnea* Jacq:- plants are still confined to gardens. Just after 3-4 successive nodes from the apex—stem becomes greyish

and lenticellate. The specific morphological and anatomical features are follows:- Liana or sinistrorse twiner, stem terete, usually solid but short primary pith disorganised at full maturity; at younger parts hairs sericeous but at maturity stem glabrous; leaf entire, margin never undulated, base slightly cordate, shape ovate to suborbicular, apiculate to acute but never acuminate as in *I. fistulosa*; phyllotaxy alternate, 2/5; lamina about 7-12 cm long, 6-11 cm broad; floral tube pale pinkish or whitish or with white spots at tube; stigma oblique, lobes unequal; capsule elliptic or elongated ovoid, tetragonal about 3 cm long, seeds attached to the replum about 3.0 mm away from the base of the capsule; flowering November to April and fruiting from the month of April; epidermal cells small, rectangular; stomata rubiaceous abnormal stomata often present as in some solanaceous plants (Ahmad 1964); stem solid thick cuticulate, epidermis unicellular, cork cells originate from the deeper chlorenchyma tissue when the stem is perfectly green; chlorenchyma thick, angular with distinct large latex vessels; cortical parenchyma large; pith parenchymatous with reserve food grains.

*Ipomoea fistulosa* Mart. ex Choisy—*I. crassicaulis* (Benth.) Rob.—*I. carnea* auct. non Jacq.—*Batatus*(?) *crassicaulis* Benth.

Very common in waste lands and gardens of India, well adapted for aquatic habitats (as emergent or tenagophyte) and terrestrial conditions; at nodes or internodes, adventitious roots grow profusely; shrubs are erect or after attaining 3 metre height—the stem-tip slightly tends to twine, but in a hedge stem is prostrate and rather weak. The plant is very poisonous and is never touched by grazing animals and is not parasitised by *Cuscuta* (Bhattacharyya 1971). On damp soil, a small piece of branch takes root very easily and so it propagates

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quickly without human care. It can be safely used as a fence-plant and may be used as a good soil binder because of its luxuriant growth and adaptability.

The morphological characters of the taxon are as follows:- stem stout, pronouncedly fistulose due to disintegration of broad pith at the initial stage of secondary growth; internodes longer, stout, terete (solid stem due to intact pith at very young primary state); younger parts villous to pilose; leaves long, margin usually undulating, base with conspicuous round lobes or truncate, apex of leaf typically long acuminate, lamina usually 16 cm long and 9 cm broad; inflorescence axillary or terminal; single to many-flowered; stigma, globular, capitate; capsule ovoid glabrous but base without thick pubescent hairs, seeds shorter in size, aborted seeds also observed with normal one, and attached—about 1.5 mm away from the replum base, flowering all through the year; and fruiting observed only from the month of May to November.

The anatomical characters of the taxon are as follows:- epidermal cells big, rectangular to wavy in outline; stomata normal rubiaceous; glands and multicellular hairs on the leaf surface; stem thin cuticulate, epidermis unicellular, cork cells originate just after the epidermal cells, chlorenchyma—3 celled with condensed chloroplast, chlorenchyma thick angular to lacunate (8-9 celled thick), cortical parenchyma large; chloroplast distributed on the side walls of chlorenchyma and cortical parenchyma; latex vessels on cortex and pith; protophloem fibre in patches; phloem and xylem rays prominent; pith parenchymatous, pith cells gradually reducing in size towards centre; central large parenchyma only disorganised and form fistulose internodes gradually with the openings of the young leaves; no reserve food-

grains observed in the pith cells.

Surveying all of these criteria there will be no trouble to identify the two species definitely and it can be confirmed that the description and figure of Bor & Raizada is of *I. fistulosa* not of *I. carnea*.

ACKNOWLEDGEMENTS

I am deeply indebted; to Dr. S. K. Mukerjee, for his keen interest and suggestions. To the authorities of the Central National Herbarium, Sibpur and Forest Research Institute, Dehra Dun.

HERBARIUM SHEETS EXAMINED FROM INDIAN HERBARIA

(Arranged according to the date of collection).

I. *I. carnea* Jacq.

Abdul Huk, No. 61, Choucha, Upper Burma, Nov. 1891.

Abdul Huk, s.n. Fort Stedman, Upper Burma, Dec. 1892.

R. N. Parker, s.n. Govt. Agri. Hort. Garden, Lahore, 7th May, 1915.

C. E. Parkinson, No. 14997, Kamagut, Rangoon, 19-9-32.

Kirat Ram, No. 3614, Cultivated on land, March 1934.

Raizada, No. 23754, Junagadh, Saurashtra, 10-10-53.

Sethe & Negi, Raizada's collectors, No. 25730, Allapali, Bombay State, 10-12-57.

V. J. Nair, No. 19931, Hissar, Punjab, 5-4-62.

P. K. Bhattacharyya, No. 998, Calcutta, 25-4-72.

II. *I. fistulosa* Mart. ex Choisy

R. N. Parker, No. 11448, Govt. Agri. Hort. Garden, Lahore, Feb. 1915.

R. N. Parker, s.n. Lahore, Feb. 1915.

C. E. Parkinson, No. 14918, Kokine (near lake), Rangoon, 1-9-32.

S. K. Jain and Bharadwaja, s.n., Coimbatore, 12-1-51.

M. B. Raizada, s.n., Shibpore Garden, 29-1-53.

M. B. Raizada, No. 23148, Gir, Hiran River, Saurashtra, 6-10-53.

T. A. Rao, No. 10951, Patiala, Punjab, 16-11-59.

S. K. Malhotra, No. 13170, Jamna Bridge, U.P., 15-12-60.



- S. K. Malhotra, No. 15302, Bindal Road, Dehra Dun, 5-6-61.  
 N. C. Nair, No. 16371, Rohtak, Punjab, 5-8-61.  
 V. J. Nair, No. 23115, Bahmanwas, Rohtak, Punjab, 12-8-62.  
 N. C. Nair, No. 25257, Gurgaon, Punjab, 25-10-62.  
 B. Naskar, s.n., Bagnan, Howrah, West Bengal, Jan. 1963.  
 U. Chatterjee, No. 161, Kailapal Forest, Purulia, 20-5-63.  
 J. K. Maheswari, s.n., Cuttack, 24-8-63.  
 S. N. Biswas, No. 26, Jhalide, Purulia, West Bengal, 11-3-64.  
 C. R. Babu, No. 33207, Rober's Cave, Dehra Dun, 23-7-64.  
 Bhatta., s.n., Bilaspore, M.P., October 1964.  
 H. Santapau, No. 139, Kalyani, West Bengal, 7-4-65.  
 A. K. Dutta, No. 823, Burdwan, West Bengal, 2-6-65.  
 N. C. Nair, No. 36584, Barnala, Punjab, 21-3-66.  
 P. K. Bhattacharyya, No. 231, Burdwan, 3-3-68.  
 D. B. Nanal, No. 39294, (?), 26-8-69.  
 D. K. Banerjee, No. 381, Kustore and Vetti Hill, Garpanchokot, (?).  
 U. C. Bhattacharyya, s.n., Gurdaspur, Punjab.  
 P. K. Bhattacharyya, No. 999, Calcutta, April 1972.  
 R. N. Banerjee, No. 159, Deshergarh and Sanctoria, Burdwan, 28-9-72.

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 ————— (1953): In *Flora Malesiana*. (Ed. by Van Steenis, C.G.G.J.). Djakarta. IV:461, 485, 599.  
 (\* Cited from Ooststroom's paper—*Blumea*, 3:489, 569-571).